S/056/61/041/002/007/028
B102/B205

26.2340

AUTHORS: Kapitsa, S. P., Bykov, V. P., Melekhin, V. N.

TITLE: An efficient high current microtron

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 2 (8), 1961, 368 - 384

TEXT: Following a series of previous publications (Ref.10: ZhETF, 39, 997, 1960) the authors describe a microtron that has none of the deficiencies connected with electron injection, which are shown by conventional accelerators of this kind. Owing to the type of resonator developed by the authors (cf. Ref. 10), the electron injection from the hot cathode is directly under the action of the h-f resonator field. The new type which uses E_{010} oscillations, makes it possible to achieve pulsed currents of 20 ma at an energy of 7 Mev, and of 5 ma at 13 Mev. The electromagnet and the vacuum chamber of the accelerator are schematically represented in Fig. 1. Fields of up to 1500 oe in an area of 55 cm diameter were homogeneous up to some 10%. The magnet had a weight of 1.5 t, and generated

fields of up to 2000 oe at a current density of 3 a/mm^2 and an excitation power of 4 kw. The magnet was fed by a three-phase selenium rectifier which was stabilized up to 0.1%. The pressure in the chamber amounted to 10^{-5} mm Hg. The h-f field was generated by a standard magnetron with a modulator. The pulse duration was 3 μsec and the frequency 427 cps. Detailed information on the motion of electrons in the cylindrical resonator with E_{010} waves being generated in it was obtained by numerical integration of the equations of motion of electrons with the electronic computer "Strela". Fig. 2 illustrates the motion of electrons in the resonator. A cross-sectional view of the resonator is given in Fig. 3. Hot cathodes of LaB_6 proved most convenient. The characteristic parameters of the accelerator in its two modes of operation (20 and 5 ma) are listed in Tables 1 and 2. The efficient electron accelerator described here can compete well with lineacs in the low-energy range. Its advantage lies in the constant energy of the beam, its "packing", its high reliability, and in its simple design. The authors thank P. L. Kapitsa, A. A. Kolosov, and S. V. Melekhin for as-

sistance, S. I. Filimonov for his interest in the work, G. P. Prudkovskiy and L. A. Vaynshteyn for a discussion, and Engineer L. Zykin for assistance in the construction of the microtron. In an appendix, a detailed report on the calculation of the motion of electrons in the microtron is given by S. P. Kapitsa, V. N. Melekhin, I. G. Krutikova, and G. P. Prudkovskiy for the case of a cylindrical and a rectangular resonator. The authors of the appendix thank P. L. Kapitsa and Ye. S. Kuznetsov for their interest in the work, M. M. Antimonik for programing the computations, and V. P. Bykov and L. A. Vaynshteyn for discussions. V. I. Veksler is mentioned. There are 13 figures, three tables, and 21 references: 9 Soviet and 12 non-Soviet. The two most important references to English-language publications read as follows: C. Henderson et al. Proc. Phys. Soc. B66, 41, 1953; J. S. Bell. Proc. Phys. Soc. B66, 802, 1953.

ASSOCIATION: Fizicheskaya laboratoriya Institut fizicheskikh problem Akademii nauk SSSR (Physical Laboratory of the Institute of Physical Problems of the Academy of Sciences USSR)

SUBMITTED: March 28, 1961

S/120/62/000/002/023/047
E032/E514

9,6000

AUTHOR: Kapitsa, S.P.

TITLE: Absolute measurements of electromagnetic energy

PERIODICAL: Pribory i tekhnika eksperimenta, no.2, 1962, 100-103

TEXT: A description is given of a device which can be used to determine the absolute intensity of electromagnetic radiation by measuring the mechanical couple acting on a conducting disc which intercepts the radiation. It is an analogue of the Rayleigh disc used in acoustics. The theory of the device is developed, leading to formulae which can be used in practice. The instrument can be used with intensities of the order of 0.1 W/cm^2 in the wavelength range 5 cm to 1 m. The absolute accuracy of the measurements is estimated as ~5%. The device was found to be suitable for testing and adjustment of UHF generators. The subject was suggested by P. L. Kapitsa. There are 2 figures.

ASSOCIATION: Institut fizicheskikh problem AN SSSR (Institute of Physical Problems AS USSR)

SUBMITTED: August 5, 1961

Card 1/1

35570
S/056/62/042/003/029/049
B102/B138

24.6730

AUTHORS: Kapitsa, S. P., Vaynshteyn, L. A.

TITLE: Radiation deceleration of electron clusters in a microtron

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 42, no. 3, 1962, 821-830

TEXT: An electron which revolutes with the velocity $c\beta$ in an orbit of radius a is slowed down by a force $F_\varphi = -2e^2\beta^3\gamma^4/3a^2$, which is due to radiation. The radiation power of a finite cluster is $P = N^2 2e^2 c\beta^4\gamma^4\theta/3a^2$, the mean decelerating force is $\overline{F}_\varphi = -N\frac{2e^2}{3a}\beta^3\gamma^4\theta$, both are related by $P = -N\overline{F}_\varphi c\beta$. These simple relations are used to calculate the coherence and the radiation deceleration effect on the electron motion in a microtron. It is also determined for which N the radiation deceleration will cause an electron leakage from the accelerating orbit. Calculations are made for ultrarelativistic electrons with $\beta \approx 1$ and $\gamma^2 \gg 1$. The coherence coefficient θ is calculated by two methods. For a thin

Card 1/4

circular beam of N electrons the general relation

$$\theta = -\frac{3}{2\beta^3\gamma^4}\int_0^{2\pi} G'(\chi)\frac{1-\beta^2\cos\psi}{2|\sin\psi/2|(1-\beta\cos\psi/2)}d\chi =$$

$$= -\frac{3}{2\beta^3\gamma^4}\int_{-\pi}^{\pi} G'(\chi)\frac{1-\beta^2\cos\psi}{2|\sin\psi/2|}d\psi, \qquad (34)$$

with $G(\chi) = \int_{-\pi} g(\chi-\mu)g(\mu)d\mu$ and $\psi - 2\beta\left|\sin\psi/2\right| = \chi$, is obtained, which holds for any β. For $\beta \geq 1$ and a short cluster ($\chi_0 \ll 1$)

$$\theta = \frac{1}{4s^3}\int_0^{\infty} H\left(\frac{\tau+\tau^3/12}{2s}\right)\left(\tau^2+\frac{\tau^4}{8}\right)d\tau, \qquad (40)$$

$$s = \gamma^3\chi_0 = \gamma^3 r_0/a \text{ и } \tau = \gamma\psi. \qquad (41)$$

Card 2/4

Radiation deceleration of electron ...

which, in the case of a homogeneous beam can be written as

$$\theta = \frac{t^3}{8s^3}\left[1+\frac{3t^2}{40}-\frac{9t}{32s}\left(1+\frac{5t^2}{36}+\frac{t^4}{192}\right)+\frac{t^2}{256s^2}\left(1+\frac{9t^2}{32}+\frac{t^4}{32}+\frac{11t^6}{6912}+\frac{t^8}{35146}\right)\right], \qquad (43)$$

with $s = (t+t^3/12)/4$ for the distribution $H(u) = \frac{3}{2}(1 - \frac{3u}{4} + \frac{u^3}{16})$ if $0 < u < 2$ and $H(u) = 0$ if $u > 2$. For $H(u) = 1/4u$ if $0 < u < 2$ and $H(u) = 0$ if $u > 2$ $\theta = \frac{3}{8s^2}\left[\frac{t^2}{4} - \ln(1+t^2/12)\right]$. The upper limit of the particle current in the microtron, determined by the coherent radiation forces, is estimated to be: $J_{max}/J_1 = 1/\sigma\gamma^3$ with $J_1 = \frac{3J_0}{8\pi^3}(-\delta\varphi)_{max} = 32$ a; $J_0 = mc^3/e$. The limiting current reaches ~1 a. In the authors' Institute the microtron current reaches 25 ma. At these currents the radiation deceleration has

Card 3/4

no effect on the operation of the microtron. Only for 15 - 30 fold currents would an effect be observed. M. S. Rabinovich and V. P. Bykov are thanked for remarks. There are 3 figures and 9 Soviet references.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems of the Academy of Sciences, USSR)

SUBMITTED: September 21, 1961

Card 4/4

ACCESSION NR: AT4014039 S/2918/63/000/000/0573/0577

AUTHOR: Kapitsa, S. P.

TITLE: Electromagnetic shock waves and their use to shape short pulses

SOURCE: AN ArmSSR. Fizicheskiy institut. Voprosy* fiziki elementarny*kh chastits, 1963, 573-577

TOPIC TAGS: electromagnetic shock wave, short pulse, nanosecond pulse, steep pulse, pulse for spark chamber, ferrite filled coaxial line, pulse rise time, pulse duration, pulse intensity

ABSTRACT: Since the use of spark chambers for particle registration calls for high voltages with very steep leading fronts, on the order of 10^{-8} sec, the author shows that electromagnetic shock waves can be used to generate high voltage pulses of nanosecond duration for spark chambers. The analysis deals with thepropagation of a

Card 1/2

ACCESSION NR: AT4014039

current or voltage pulse through a ferrite-filled coaxial line. Estimates of the limiting front slope and its use for this purpose are based on the calculations by A. V. Gaponov and G. I. Freydman (ZhETF v. 36, 957, 1959). An installation using a ferrite with rectangular hysteresis curve, 7 cm in diameter and 3 meters long, can shape 10^{-9}--10^{-8} sec pulses with front 10^{-9} sec of 200 kV amplitude. For a line wave resistance of 32 ohms this corresponds to an approximate current of 700 amperes. It is thus concluded that generation of nanosecond high-power pulses by means of shock waves, particularly as applied to spark chambers, offers great promise. Orig. art. has: 3 figures and 5 formulas.

ASSOCIATION: Fizicheskiy institut AN ArmSSR (Physics Institute AN ArmSSR)

SUBMITTED: 00	DATE ACQ: 20Feb64	ENCL: 00
SUB CODE: GE, EE	NO REF SOV: 004	OTHER: 000

Card 2/2

KAPITSA, S.P.

Selenoid in a uniform magnetic field. Elektron. bol'sh. moshch. no.2:109-118 '63 (MIRA 17:7)

ACCESSION NR: AT4015876 S/3055/63/000/002/0119/0121

AUTHORS: Kapitsa, S. P.; Kondrat'yev, N. I.

TITLE: Broadband panoramic wavemeter

SOURCE: AN SSSR. Fizicheskaya laboratoriya. Elektronika bol'shikh moshchnostey (High-power electronics), no. 2, 1963, 119-121

TOPIC TAGS: wavemeter, parnoramic wavemeter, panoramic broadband wavemeter, wavelength bandwidth, oscilloscope wave display

ABSTRACT: The wavemeter described differs from those hitherto known in that it can be used to observe the spectrum of continuous oscillations at high frequency over a wide range of wavelengths. It is based on a tunable quarter-wave coaxial cavity, the axial conductor of which is moved longitudinally by a motor, so that the effective length of the cavity varies periodically about some average value. The oscilloscope beam is scanned in phase with the tuning

Card 1/2

ACCESSION NR: AT4015876

of the wavemeter and the vertical beam deflection is determined by the detector signal. Consequently, a continuous monochromatic signal is represented in the form of a resonance curve of the coaxial resonator, the position of which on the screen depends on the signal frequency. A wavelength bandwidth up to 12 cm can be accommodated, and the range of measurements is between 5 and 50 cm. The accuracy with which the absolute wavelength is determined is 2--3%, but the relative wavelength can be determined accurate to 0.2%. The use of an induction motor eliminates parasitic pickup at power line frequency and its harmonics. "In conclusion, the authors are grateful to P. L. Kapitsa for interest and support of this work." Orig. art. has: 2 figures.

ASSOCIATION: Fizicheskaya laboratoriya AN SSSR (Physics Laboratory, AN SSSR)

SUBMITTED: 00	DATE ACQ: 25Jan64	ENCL: 00
SUB CODE: GE, SD	NR REF SOV: 000	OTHER: 000

Card 2/2

ACCESSION NR: AT4015877 S/3055/63/000/002/0122/0132

AUTHORS: Kapitsa, S. P.; Kondrat'yev, N. I.; Petrusevich, Yu. M.

TITLE: Microwave measurements with recording on graph paper

SOURCE: AN SSSR. Fizicheskaya laboratoriya. Elektronika bol'shikh moshchnostey (High-power electronics), no. 2, 1963, 122-132

TOPIC TAGS: microwave measurement, microwave measurement plotting, plotting table, resonance curve plotting, broadband wavemeter, field plotting, current voltage characteristic plotting

ABSTRACT: A method is described by which microwave measurements can be plotted on a graph paper automatically for further processing. The microwave measurement procedure used in the laboratory is also described. The key piece of equipment is an automatic plotting table employing some of the drives from an automatic recording potentiometer. The plotting table records the connection between two

Card 1/4

ACCESSION NR: AT4015877

quantities, one of which is varied by rotating a synchronous motor and the other one is varied by the measuring circuit. The uses of the equipment for the plotting of resonance curves, as a broadband wavemeter, for calibration against a heterodyne wavemeter, and for plotting of resonance curves with the aid of a klystron are described. In addition to recording resonance curves, the plotting table can be used to study the distribution of high-frequency fields, to study the current-voltage characteristics, and for many other applications. "The authors are grateful to P. L. Kapitsa for interest in the work and for support." Orig. art. has: 9 figures and 10 formulas.

ASSOCIATION: Fizicheskaya laboratoriya AN SSSR (Physics Laboratory, AN SSSR)

SUBMITTED: 00 DATE ACQ: 25Jan64 ENCL: 02

SUB CODE: EE, SD NR REF SOV: 003 OTHER: 000

Card 2/4

ACCESSION NR: AT4015878 S/3055/63/000/002/0133/0147

AUTHORS: Kapitsa, S. P.; Tsipenyuk, Yu. M.

TITLE: Measurement of high frequency fields in resonators

SOURCE: AN SSSR. Fizicheskaya laboratoriya. Elektronika bol'shikh moshchnostey (High-power electronics), no. 2, 1963, 133-147

TOPIC TAGS: cavity field distribution, cavity shunt resistance, frequency discriminator, probe field measurement, dielectric probe, metal probe, field plotting, electromagnetic field plotting

ABSTRACT: The distribution of the electromagnetic field in a cavity and the shunt resistance of a cavity are determined by determining the perturbation of the magnetic field caused by introducing a small sphere into the field. The cavity acts in this method like a frequency discriminator, in which the perturbation of the natural frequency leads to a change in the field amplitude. The resultant sig-

Card 1/4

ACCESSION NR: AT4015878

nal is detected, fed to an oscilloscope, and photographed. The use of the cavity as a frequency discriminator excludes the need for absolute determination of the frequency shift. The shunt resistance of the cavity is determined directly without measuring the Q or the geometrical characteristic. Two measurements are made, with dielectric and metallic spheres, to determine the relative distribution of the electric and magnetic field. A third measurement is necessary to normalize the signal. Tests have shown that the accuracy with which the shunt resistance and the field distribution are determined is approximately 8%. The method can be used to determine the influence of the shape of the resonator and the presence of holes in it on the field distribution, and can be particularly useful when the cavity is too complicated in shape for a theoretical study. The accuracy is limited primarily by the parasitic modulation in microwave generators, and by the linearity limit of the method. "The authors are grateful to P. L. Kapitsa for interest in the work." Orig. art. has: 9 figures and 14 formulas.

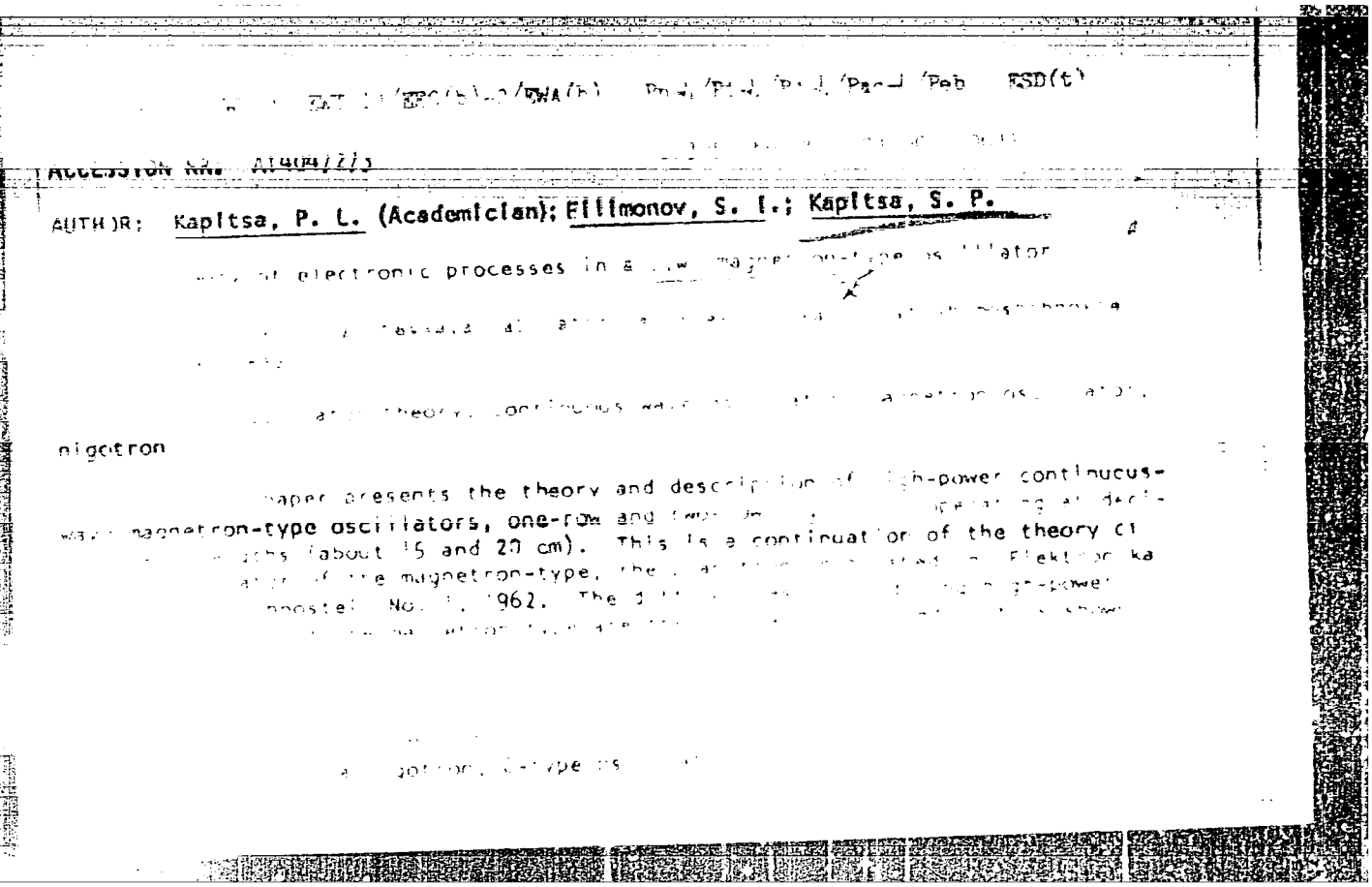
Card 2/4

ACCESSION NR: AT4015878

ASSOCIATION: Fizicheskaya laboratoriya AN SSSR (Physics Laboratory, AN SSSR)

SUBMITTED: 00	DATE ACQ: 25Jan64	ENCL: 01
SUB CODE: GE, SD	NR REF SOV: 002	OTHER: 001

Card 3/4



ACCESSION NR: AT4014713

AUTHOR: Kapitsa, P. L. (Academician); Filimonov, S. I.; Kapitsa, S. P.

[illegible] of electronic processes in a [illegible] magnetron-type oscillator

[illegible]

[illegible] theory, continuous [illegible]

magnetron

[illegible] paper presents the theory and description of high-power continuous-wave magnetron-type oscillators, one-row and [illegible] operating at decimeter wavelengths (about 15 and 20 cm). This is a continuation of the theory of the magnetron-type, the [illegible] in Elektronika [illegible] Supplement No. 1, 1962. The [illegible]

[illegible] magnetron, [illegible] type [illegible]

AT4047273

...ion which takes place in a magnet... ...of a nigro-
... mode is excited ...

easily and even in the first models the efficiency reached 30% at a 1.7 kwatt out-
put (5 cm wavelength). Further development resulted in two-row nigotrons whose
... exceeded 50%. The main performance indices of this device are evaluat-
...

...

EPA(w)-2/EWT(m)/EWP(1) Pt-7/Pab

Microtron and its applications

Atomnaya energiya, v. 18, no. 3, 203-209

electron accelerator, nuclear engineering

A short survey is given of the development of a high current beam microtron. Comparisons are made of this new type electron accelerator with other high energy electron accelerators. The scientific and technological fields of the applications are discussed. Orig. art. has 4 figures and 1 formulas.

SUB CODE: none

SUBM DATE: [illegible] ENCL: 00 SUB CODE: NP

NO REF SOV: 013 OTHER: 001 NA

Card 1/1 JPRS

L 4239-66 EWT(m)/EPA(w)-2/EWA(m)-2 IJP(c) GS

ACCESSION NR: AT5007975 S/0000/64/000/000/1049/1052

AUTHOR: Zykin, L. M.; Kapitsa, S. P.; Melekhin, V. N.; Nedelyayev, A. G. 32 B+1

TITLE: Microtron with large current

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 1049-1052

TOPIC TAGS: high energy accelerator, electron accelerator, electron beam

ABSTRACT: The present report expounds the principal results which have been obtained in recent years in the study and design of microtrons at the Institute of Physical Problems im. S. K. Vavilov, Academy of Sciences SSSR, and discusses the principal properties of accelerators of this type. Until recently the microtron did not attract great attention as an electron accelerator, mainly by virtue of the small beam intensity which is obtained by this type of accelerator. However, works conducted in the physical laboratory of the mentioned institute have led to new methods for the introduction of electrons into the acceleration regime and have thus opened an approach to the new development of this accelerator (Kapitsa, S. P.; Bykov, V. P.; Melekhin, V. N. *ZhETF* 41, 368 (1961)). The basis for the perfection of the microtron is the application of resonators of plane cylindrical

Card 1/3

or rectangular form, in which fields of the type E_{010} and E_{011} respectively are excited. Electron emission ordinarily occurs directly under the action of the electrical super-high frequency field of the resonator with emitter, which is arranged on the plane wall of the resonator on the side from the passage apertures. Entrapment of the electrons into the microtron acceleration regime can occur in several ways, designated trajectories of the first and second types. During acceleration in the first regime, in which the cathode is situated approximately at half of the radius of the resonator, an electron acquires energy around $\Delta E \sim mc^2$ at each passage through the flight interval. The precise value of the energy is determined by the value of the magnetic field, more correctly by the ratio of the magnetic field to its cyclotron value $H = \frac{2\pi mc^2}{e\lambda}$. For given geometry this ratio $\Omega = H/H_0$ can vary within wide limits ($0.8 < \Omega < 1.6$), thus permitting continuous variation of the energy at output from the machine up to double, with unvaried position and number of orbits. In the second regime the cathode is placed close to the resonator axis and the electron increases its energy by $\Delta E \sim 2mc^2$ for each passage through the flight interval. The dimensions of the resonator, position of the emitter and the fraction of particles entrapped into the acceleration regime

L 2343-66 EWT(m)/EWA(h)
ACCESSION NR: AT5022126 UR/3158/65/000/001/0001/0007

AUTHORS: Soldatov, A. S.; Smirenkin, G. N.; Kapitsa, S. P.; Tsipenyuk, M. Yu.

TITLE: Fission of uranium-238 by quadrupole absorption of gamma-quanta

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, no. 1, 1965. Deleniye urana-238 pri kvadrupol'nom pogloshchenii gamma-kvantov, 1-7

TOPIC TAGS: uranium, fission product, fission, gamma ray, bremsstrahlung

ABSTRACT: The angular distribution of fission fragments during the photofission of U^{238} under $F^{19}(p,\alpha,\gamma)O^{16}$ gamma-quanta reaction and electron bremsstrahlung radiation was measured. The apparatus used for measuring this angular distribution is given schematically in Fig. 1 on the Enclosure. The two U^{238} layers are of thickness 1 mg/cm^2. All the data were reduced, using mean square fit curves, and the angular distribution of the fragments was expressed by

$$W(\vartheta) = a + b\sin^2\vartheta + c\sin^2 2\vartheta.$$

The gamma-ray source was a thick CaF_2 crystal target irradiated by 1.45 Mev protons. The angular distribution results were plotted on a graph next to the data of B. Forkman and S. A. E. Johansson (Nucl. Phys. 20, 136, 1960). The present curve was

Card 1/3

found to lie consistently below the one given by Forkman and Johansson because of the large quadrupole component in the total fission cross section in the region of 6 to 7 Mev. The gamma-ray electron bremsstrahlung radiation experiments were done in the 12 Mev microtron at the Physical Problem Institute, AN SSSR. The target was a tungsten disk of 1 mm thickness behind which was placed the apparatus for angular distribution measurement. The results were plotted graphically as the ratios a/b, c/b versus $E_m (5 \leq E_m \leq 10)$. The magnitude of a/b throughout these experiments lay systematically below similar data reported by other authors, probably because of a difference in target thickness. "The authors are deeply grateful to L. N. Usachev and N. S. Rabotnov for helping in the work, to P. L. Kapitsa for supporting the work, to V. P. Perelygin and S. P. Tret'yakova for acquainting us with the fission fragment recording technique, and to M. K. Golubeva, L. D. Gordeyeva and N. Ye. Federova for taking part in the testr." Orig. art. has: 4 figures and 1 equation.

ASSOCIATION: Fiziko-energeticheskiy institut, Obninsk (Physico-Power Institute, Obninsk); Institut fizicheskikh problem, AN SSSR (Institute of Physical Problems, AN SSSR)

SUBMITTED: 00 ENCL: 01 SUB CODE: NP
NO REF SOV: 006 OTHER: 006

L 2343-66
ACCESSION NR: AT5022126

ENCLOSURE: 01

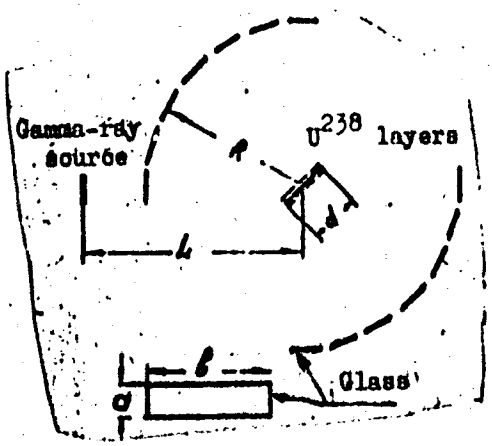


Fig. 1.

Card 3/3

L 8224-66 EWT(m)/EWA(m)-2 IJP(c)
ACC NR: AT5027161 SOURCE CODE: UR/3055/65/000/004/0178/0189

AUTHOR: Kapitsa, S. P. (Academician)

ORG: none

TITLE: Continuous microtron

SOURCE: AN SSSR. Fizicheskaya laboratoriya. Elektronika bol'shikh moshchnostey, no. 4, 1965, 178-189

TOPIC TAGS: electron accelerator, cyclotron, quantum electronics, gamma radiation, quantum generator, nuclear physics research facility, neutron radiation

ABSTRACT: The author examines the characteristics of a continuous microtron by studying accelerators with orbit number N = 30, 60, and 90, and pole diameters D = 2, 4, and 6 m, respectively, as shown in Table 1.

Table 1

D, m	N	D_N, mm	Beam energy, MEV		
			Q = 0.7	Q = 1	Q = 1.2
2	30	1900	11	15	18
4	60	3800	21	31	37
6	90	5700	32	46	55

Card 1/3

L 8224-66
ACC NR: AT5027161

The calculations are based on data from experimental work performed in recent years at the Physics Laboratory of AN SSSR (Fizicheskaya laboratoriya AN SSSR). It is shown that in the medium energy range (15-40 MEV) the continuous microtron becomes an extremely effective source of accelerated electrons. With respect to nuclear physics problems, the microtron presents the greatest interest in the energy range up to 50 MEV, when it generates beam intensities several orders greater than other accelerators, which will make it possible to conduct experiments impossible to perform with other types of accelerators. At lower energies the microtron proves to be highly effective in radiation chemistry, the study of substances and materials, investigations in high-intensity gamma radiation, and in the continuous generation of neutrons. The most efficient accelerator of the variations studied proves to be the 4- or 5-meter accelerator, the operating principles of which are quite obvious, and the technical difficulties involved in its design are fully surmountable. Such an accelerator is approximately equal in dimensions to the conventional 1.5-meter 15—20-MEV cyclotron. The rated capacity of the device will be 500—750 kw, with 80% of this capacity intended for the UHF generator, since the other units of the accelerator (magnet, vacuum, ventilation, cooling, and control) do not require a large amount of power. Due to the great penetrating capabilities of gamma-rays and neutrons, the protective shields of the microtron should be greater than that of the cyclotron (e.g., protection from a direct beam requires attenuation by 10^{10} times, which may be effected by 3—3.5-m thick conventional concrete). Intense gamma-radiation presents some difficulties with respect to induced activity; this problem, however, can also be overcome. High-power decimeter-range generators are naturally of practical application in microtrons;

Card 2/3

L 8224-66

ACC NR: AT5027161

hence, the design of such an accelerator is closely related to high-energy electronics. The author concludes that the continuous microtron represents an accelerator of great potential, and will make it possible to find new solutions for problems facing modern physics and engineering. "The author considers it his pleasant duty to express his gratitude to P. L. Kapitsa for constant interest in the work, and to V. N. Melekhin for useful discussions and remarks." Orig. art. has: 5 tables and 1 figure. [08]

SUB CODE: 20/ SUBM DATE: 00Jun63/ ORIG REF: 008/ OTH REF: 001/ ATD PRESS: 4148

Card 3/3

L 1954-66 EWT(m)/EWA(h) UR/3158/65/000/012/0001/0012 37 35 B+1

ACCESSION NR: AT5024113

AUTHOR: Rabotnov, N. S.; Smirenkin, G. N.; Soldatov, A. S.; Usachev, L. N.; Kapitsa, S. P.; Tsipenyuk, Yu. M.

TITLE: Angular photofission anisotropy and parity of the ground state of plutonium-239 19

SOURCE: Obninsk. Fiziko-energeticheskiy institut. Doklady, no. 12, 1965. Uglovaya anizotropiya fotodeleniya i chetnost' osnovnogo sostoyaniya plutoniya-239, 1-12

TOPIC TAGS: nuclear fission, plutonium, ground state, bremsstrahlung

ABSTRACT: The angular distributions of fragments resulting from the photofission of Pu^{239} were measured by γ quanta of the bremsstrahlung of a microtron in the range of limiting energies of E_{max}=5.4-7.9 Mev. At E_{max}=5.4, 5.65, and 5.9 Mev, anisotropic angular distributions of the form $W(\sigma) = a+b \sin^2\sigma$ were observed. The maximum anisotropy, which corresponds to $\frac{b}{a} = -0.192$, was recorded at E_{max} = =5.65 Mev. Comparison of the results with data on the fission of Pu^{238} by neutrons permits the determination of the parity of the ground state of Pu^{239} relative to

Card 1/2

L 1954-66
ACCESSION NR: AT5024113

2

the parity of the ground state of the even-even nucleus. Data on the fission agree with the positive parity of the ground state of Pu^{239}, which follows from spectroscopic data. Orig. art. has: 2 figures, 1 table, 10 formulas.

ASSOCIATION: Fiziko-energeticheskiy institut GKIAE (Physics and Energetics Institute GKIAE); Institut fizicheskikh problem (Institute of Physical Problems)

SUBMITTED: 00 ENCL: 00 SUB CODE: NP

NO REF SOV: 003 OTHER: 009

Card 2/2

BOCHAROVA, I.Ye.; ZOLOTUKHIN, V.G.; KAPITSA, S.P.; SMIRENKIN, G.N.; SOLDATOV, A.S.; TSIPENYUK, Yu.M.

Angular distribution of fragments near the threshold of U^{238} photofission. Zhur. eksp. i teor. fiz. 49 no.2:476-484 Ag '65. (MIRA 18:9)

1. Institut fizicheskikh problem AN SSSR.

L 22417-66 EWT(m)/EPF(n)-2/EWG(m) WW

ACC NR: AP6007943 SOURCE CODE: UR/0089/66/020/002/0106/0111

AUTHORS: Anan'yev, V. D.; Antsupov, P. S.; Kapitsa, S. P.; Khar'yuzov, R. V.; Matora, I. M.; Melekhin, V. N.; Merkulov, L. A.

ORG: none

TITLE: 30 Mev microtron injector for a fast-neutron pulsed reactor

SOURCE: Atomnaya energiya, v. 20, no. 2, 1966, 106-111

TOPIC TAGS: linear accelerator, particle accelerator component, fast neutron, fast reactor/[illegible]

ABSTRACT: The authors describe briefly the main features and parameters of the 30-Mev microtron injector (linear-accelerator injector) now in operation at the Laboratory of Neutron Physics of OIYaN. The use of a microtron helps greatly reduce the duration of the reactor activity burst and by the same token improve the resolution attainable with fast-neutron experiments, since the reactor does not become supercritical and serves only as a neutron multiplier.

Card 1/2 UDC: 621.384.611.3

L 22417-66
ACC NR: AP6007943

The microtron is identical in design with that of the IFP (L. M. Zykin et al., Transactions of International Conference on Accelerators, Dubna, 1963, p. 1049). The individual units of the microtron as modified to operate with the IBR reactor are described briefly, together with the results of approximately 350 hours of operation. The electron current, separated and focused on a remote target, reaches 60 ma in pulse. An original optical system for extraction, focusing, and aiming the beam on the target, together with the good monochromatic properties of the beam (energy scatter 0.3%) and small angle divergence ensure 100% efficiency of utilization of electrons remaining in the last (thirtieth) orbit. The authors thank D. I. Blokhintsev, P. L. Kapitsa, I. M. Frank, and F. L. Shapiro for continuous interest and help, and S. K. Nikolayev, B. I. Voronov, and B. N. Bunin, whose cooperation contributed to the construction of the accelerator. Orig. art. has: 6 figures

SUB CODE: 18 SUBM DATE: 09Aug65/ ORIG REF: 003/

Card 2/2

L 27871-66 EWT(m)/EWA(h)

ACCESSION NR: AP5021112 UR/0056/65/049/002/0476/0484 17 16 B

AUTHORS: Bocharova, I. Ye.; Zolotukhin, V. G.; Kapitsa, S. P.; Smirenkin, G. N.; Soldatov, A. S.; Tsipenyuk, Yu. M.

TITLE: Angular distribution of U-238 photofission fragments near the fission threshold 19

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 2, 1965, 476-484

TOPIC TAGS: uranium, photonulcear reaction, nuclear fission, angular distribution, fission product

ABSTRACT: A preliminary report on this research was published in Physics Letters v. 14, 217, 1965. To observe quadrupole fission experimentally, the angular distribution of the fragments emitted in photofission of U^{238} near threshold were measured by recording the fission events in glass. The photons were produced by electrons accelerated in the 12-MeV high-current microtron of IFP AN SSSR (Institute of Physics Problems, AN SSSR). The angular distributions of

Card 1/3 090411 05

the fragments were measured at proton energies 5.2, 5.4, 5.65, 5.9, 6.4, 6.9, and 9.25 MeV. The immediate purpose was to detect the component proportional to $\sin^2 2\theta$ in the angular distribution, which should be due to the $2^+(K = 0)$ channel in quadrupole photon absorption which has been shown to have a much lower cross section than dipole absorption (K -- projection of the total angular momentum on the fission axis). The experimental results confirm the hypothesis by A. Bohr (International Conference on Peaceful Uses of Atomic Energy, Geneva 1955, v. 2, Fizmatgiz 1958, page 175) regarding the similarity of the fission-channel spectrum and the lower-excited-level spectrum near the ground state of the equilibrium nucleus. The distance between the threshold of the fission channels for 2^+ and 1^-, $(K = 0)$ as well as 1^-, $(K = 0)$ and 1^-, $(K = 1)$ is not less than 0.5 MeV. Other important results of the research are the high anisotropy of photofission for low photon energies, and the appreciable distance between thresholds of the fission channels 2^+ and 1^- $(K = 0)$ on the

L 27871-66
ACCESSION NR: AP5021112

7

one hand 1^- (K = 1) on the other. A more detailed analysis will be made after data are obtained on the photofission of Th^{232} and Pu^{240}.
'The authors thank L. N. Usachev and N. S. Rabotnov for interest and helpful discussions, P. L. Kapitsa for supporting the research, and M. K. Golubeva, L. D. Gordeyeva and N. Ye. Fedorova for participation in the work.' Orig. art. has: 6 figures, 4 formulas, and 1 table.

ASSOCIATION: Institut fizicheskikh problem Akademii nauk SSSR (Institute of Physical Problems, Academy of Sciences, SSSR)

SUBMITTED: 31Mar65 ENCL: 00 SUB CODE: NP

NR REF SOV: 007 OTHER: 008

Card 3/3 Q0

L 29009-66 EWT(1) IJP(c)

ACC NR: AP6018843 SOURCE CODE: UR/0053/66/088/001/0191/0194

AUTHOR: Kapitsa, S. P.

ORG: Institute for Physics Problems, AN SSSR (Institut fizicheskikh problem AN SSSR)

TITLE: Natural system of units in classical electrodynamics and electronics 52 B

SOURCE: Uspekhi fizicheskikh nauk, v. 88, no. 1, 1966, 191-194

TOPIC TAGS: electrodynamics, electron energy, Planck constant, electron accelerator, electronic equipment

ABSTRACT: The article proposes a system of units which may be called natural for classical electrodynamics. The point of such a system is to introduce scales for numerical evaluations of various electronic phenomena and to simplify the writing of formulas. The proposed system uses the classical electron radius r_0 as the unit of length, electron rest energy mc^2 as the unit of energy, and electron mass as the unit of mass. Planck's constant is found to equal 137 in the proposed system. The author considers the new system convenient for the solution of problems in classical electrodynamics and electronics and gives units for voltage, current, and power to demonstrate this. The value obtained for power is characteristic of relativistic electronic devices and occurs in the theory of electron accelerators. No new physical findings will result from the use of the proposed system, the author states, but it should be handy for claculating phenomena and for explaining and teaching electrodynamics. The author thanks Professor Kh. Al'ven for the discussions of the questions posed at a seminar at the Institute of Plasma and Electron Physics in Stockholm which encouraged him to write this article. Orig. art. has: 1 table and 14 formulas. [JPRS]

SUB CODE: 20,09/ SUBM DATE: none / ORIG REF: 006/ OTH REF: 001

UDC: 537.71

Card 1/1 BLG

KAPITSA, T. N.

T. N. Kapitsa

The problem of the formation of mesons.

Zhurnal Eksperimental'noi i teoreticheskoi fiziki

21, 5, 1951, 581

From: D.S.I.R. Trans. con. list. of R-Per. No. 31, Oct. 1951, p. 82

YEGOROVA, N.I.; KAPITSINA, O.L.

Work of the experimental shops. Shvein.prom. no.2:15-16 Mr-Ap '62. (MIRA 15:4)
(Leningrad--Clothing industry)

GOLIGORSKIY, S. D.,: KAPITSKAYA, I. A.

Mbr., Departmental surgical clinic, Kishinev state medical institute

"Case of acute cholecystitis in a two-year-old child," Vest. khir. 72 no.4 Jl-Ag 1952.

SHEVTSOV, V.; KAPITSKIY, A.

Improve the equipment of new buildings. Muk.-elev. prom. 27 no.8:22-25 Ag '61. (MIRA 14:7)

1. Glavnyy inzhener tresta Spetselevatormel'stroy (for Shevtsov).
2. Nachal'nik otdela oborudovaniya tresta Spetselevatormel'stroy (for Kapitskiy).

(Grain-handling machinery)
(Grain-milling machinery)

KAPITSKIY, K.

Training in economic for all workers. NTO 2 no.12:44 D '60.
(MIRA 14:3)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo soveta Nauchno-tekhnicheskogo obshchestva.
(Rostov Province--Economics--Study and teaching)

KAPITSKIY, R.

Cooperating with economic councils. NTO no.1:43-45 Ja '59.
(MIRA 12:2)

1. Zamestitel' predsedatelya presidiuma Rostovskogo oblastnogo soveta nauchno-tekhnicheskikh obshchestv.
(Rostov Province--Research, Industrial)

KAPITSKIY, R.

Good initiative of the council of public design offices. NTO 3 no.2:55 F '61. (MIRA 14:3)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo soveta Nauchno-tekhnicheskogo obshchestva.
(Rostov Province—Technological innovations)

KAPITSKIY, R.

Control of execution is highly important. NTO 3 no.8:51-52 Ag '61. (MIRA 14:9)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo soveta Nauchno-tekhnicheskikh obshchestv.
(Rostov Province--Research, Industrial)

POPOV, Yu.; KAPITSKIY, R.; GOLOTA, D.; UVAROV, V.; KHAIS, A.; ZHUKOV, A., insh.-geolog; ABUSHAYEV, I. (Kaliningrad)

Our readers' letters. NTO 3 no.3:57 Mr '61. (MIRA 14:3)

1. Nachal'nik proizvodstvenno-tekhnicheskogo otdela i chlen soveta nauchno-tekhnicheskogo obshchestva tresta "Pechorlesosplav", g. Pechora (for Popov). 2. Zamestitel' predsedatelya Rostovskogo obshchestva, g. Rostov-na-Donu (for Kapitskiy). 3. Uchenyy sekretar' soveta nauchno-tekhnicheskogo obshchestva Krasnodarskoy geologicheskoy ekspeditsii (for Golota). 4. Zamestitel' direktora Gorodenkovskogo khlebopriyemnogo punkta g. Gorodenko, Stanislavskoy oblasti (for Uvarov). 5. Chlen Zapadno-Sibirskogo pravleniya nauchno-tekhnicheskogo obshchestva gornoye, st. Izhmorskaya, Kemerovskoy oblasti (for Zhukov).

(Technology—Information services)

KAPITSKIY, R., inzh.

For engineers. NTO 5 no.1:58 Ja '63. (MIRA 16:5)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo soveta nauchno-tekhnicheskikh obshchestv.
(Mechanical engineering)

AUTHOR: Kapitskiy, R.A., Engineer SOV-117-58-8-26/28

TITLE: All-Union Conference on Problems of Designing and Producing Agricultural Machines (Vsesoyuznaya konferentsiya po voprosam konstruirovaniya i proizvodstva sel'skokhozyaystvennykh mashin)

PERIODICAL: Mashinostroitel', 1958, Nr 8, p 46 (USSR)

ABSTRACT: The All-Union Scientific Technical Conference on problems of of designing and producing agricultural machines was convened in Rostov-on-Don in January 1958. The plenary session heard the report of Candidate of Technical Sciences A.Z. Zhuravlev, on the results of the execution of the resolutions made by the conference in 1953. Candidate of Technical Sciences Ya.M. Zhuk, VIM, read a paper on "The Results of the Study of the Two-Phase Method of Combine Harvesting in the USSR and of the Requirements of the System of Machines Needed for this Method". Candidate of Technical Sciences I.I. Trepenenkov, NATI, read on "The Methods for the Development of the Designing of Agricultural Tractors"; Doctor of Technical Sciences M.A. Pustygin, VISKhOM, on "The Principal Problems of the Development of Cereal Harvesting Combines"; Engineer V.D. Lavrent'yev on "Specialization and Cooperation in the Production of Agricultural Machines"; Engineer O.M. Kotovich, VISKhOM, on

Card 1/3

All-Union Conference on Problems of Designing and Producing Agricultural Machines

"Rational Profiles and Reduction of Assortment of Rolled Metal in Agricultural Machinebuilding"; Engineer G.M. Fedorishchenko on "Results of the Work of VNIIMESKh in the Field of the Electric Drive of Mobile Agricultural Machines"; Engineer P.V. Savich from the Institute of Machine Science of the UkrSSR Academy of Sciences on "The Determination of the Density of Soils by Means of Radioactive Isotopes"; Candidate of Technical Sciences S.A. Alferov, VISKhOM, on "The Design of Foreign Cereal Harvesting Combines"; Engineer A.I. Malitskiy on "New Designs of Corn-Harvesting Combines"; Candidate of Technical Sciences Ye.S. Bosoy on "Field Tests of Cutting Apparatus for an Ensilage Harvesting Combine"; the professor of the Khar'kov Polytechnical Institute A.I. Petrusov on "Methods for the Further Investigation of the Square-Pit Sowing Machine"; the lecturer of the Rostov Institute of Railroad Transport Engineers A.I. Zelenov on "A New Method for Cold Electric Welding for the Restitution of Rejected Details of Agricultural Machines"; the lecturer of the Novocherkassk Polytechnical Institute Ye.L. Lokshin on "Processing of Metals by Hydraulic

All-Union Conference on Problems of Designing and Producing Agricultural Machines

Blows of Ultrasound Frequency"; and the engineer of the Rostov Scientific Research Technological Institute D.M. Nabrodov on "New Methods of Casting in Agricultural Machine-Building". The conference recommended close cooperation between the designing bureaus, the scientific research organizations and the chairs of the various institutes for the development of new agricultural machines taking into consideration zonal differences. Special attention should be paid to the automation of the control of the various mechanisms.

1. Agricultural machines - Design 2. Agricultural machines - Production 3. Conferences - Agricultural machines - Rostov-on-Don

Card 3/3

KAPITSKIY, R.A.

Scientific and technical conference on electric locomotive construction. Elek. i tepl. tiaga 2 no.9:38 S '58. (MIRA 11:10)

1. Zamestitel' predsedatelya Rostovskogo mezhoblastnogo pravleniya nauchno-tekhnicheskogo obshchestva energeticheskoy promyshlennosti.
(Electric locomotives--Construction--Congresses)

KAPITSKIY, R. A

First results. NTO no.6:51-52 Je '59. (MIRA 12:9)

1.Zamestitel' predsedatelya presidiuma Rostovskogo oblastnogo soveta nauchno-tekhnicheskikh obshchestv.
(Research, Industrial)

SOV/110-59-6-23/24

AUTHOR: Kapitskiy, R.A., Engineer

TITLE: The Second All-Union Scientific Technical Conference on Electric Locomotive Construction (Vtoraya vsesoyuznaya nauchno-tekhnicheskaya konferentsiya po elektrovozostroyeniyu)

PERIODICAL: Vestnik elektropromyshlennosti, 1959, Nr 6, pp 78-79(USSR)

ABSTRACT: The second All-Union Scientific Technical Conference on Electric Locomotive construction was held in Novocherkassk. The conference was called by the Rostov Inter-Regional Directorate of the Scientific Technical Society of the Power Industry and the Council of National Economy of the Rostov Economic Administrative Region. The conference was attended by 300 representatives of locomotive building and repair works, electrified railways, scientific research institutes, colleges, GOSPLAN USSR, GOSPLAN RSFSR, the Ministry of Communications of the USSR and others. Reports were read on the development of electrification of Soviet railways, on the design of electric locomotives, their testing and operation and also on scientific work on electric locomotive construction. The chief engineer of

Card 1/4

The Second All-Union Scientific Technical Conference on Electric Locomotive Construction

the Directorate of Railway Electrification of the Ministry of Railroads, I.I.Ivanov, gave a report on railway electrification in the USSR. The head of the technical department of the Rostov Council of National Economy, V.D.Lavrent'yev, reported on the development of electric locomotive construction in the USSR and the chief engineer of the Novocherkassk Electric Locomotive works, S.N.Yelkin, described progress at the works. The chief engineer of the Tbilisi Electric Locomotive works, A.A.Maskharashvili, reported on the future development of electric locomotive manufacture at his works. Candidate of Economic Sciences, I.P.Dianov reported on the development of inter-factory cooperation and specialisation in the manufacture of electric locomotives. The chief designer of the Novocherkassk Electric Locomotive works, B.V.Suslov, discussed design development problems of main-line electric locomotives. Engineer Ye.S.Avatkov reported on the development of electric locomotive construction abroad. The conference

The Second All-Union Scientific Technical Conference on Electric Locomotive Construction

also heard reports by I.P.Il'in on the operation and test results of new types of electric locomotives and by Engineer A.A.Kurochka on scientific research work at the Novocherkassk Electric Locomotive works. Several other authors are briefly mentioned. An exhibition that was organised in connection with the conference by the Novocherkassk Electric Locomotive works is described. The delegates visited the locomotive works and the laboratories of the Polytechnical Institute. The decisions of the Conference included a list of measures that should be taken to ensure high rates of railway electrification. Special attention should be paid to the quality of electric locomotives. Although considerable success has been achieved in electric locomotive construction, further improvement is necessary in some respects. Inadequate use is made of new insulating materials. Standardisation of equipment is inadequate. There is need of a line electrified at 25 kV a.c. for testing

The Second All-Union Scientific Technical Conference on Electric Locomotive Construction

of newly-developed locomotives. The research work that is being done in a number of institutes on locomotive design should be coordinated. Further research is needed on the dynamics of electric locomotives, using modelling methods.

Card 4/4

SOV/91-59-8-23/28

8(6), 25(5)

AUTHOR: Kapitskiy, R.A., Engineer

TITLE: The Efforts of the Rostov Interoblast' NTOEP Organization for Completing the Seven-Year Plan Ahead of Schedule

PERIODICAL: Energetik, 1959, Nr 8, pp 37-39 (USSR)

ABSTRACT: The article deals with the activities of the second plenary session of the Rostovskoye mezhoblastnoye pravleniye NTOEP (Rostov Interoblast' Management of NTOEP). More than 100 representatives of the primary NTOEP organizations participated. They came from Rostov-na-Donu, Novocherkassk, Taganrog, Krasnodar, Pyatigorsk, Sochi, Shakhty and other towns. The Rostov Interoblast' NTOEP organization has about 2617 members at the present time. Chairman of this organization is D.S. Babich, head of the Upravleniye energeticheskogo khozyaystva Rostovskogo sovnarkhoza (Directorate of Power Economy of the Rostov Sovnarkhoz). Babich and a number of other NTOEP officials reported on the work of the primary organizations within industrial installations and organizations, for example: S.V. Gridnev, director of the Rostov division of "Teploelektroproyekt"; V.A. Varichev, chief engineer of the Nes-

Card 1/2

The Efforts of the Rostov Interoblast' NTOEP Organization for Completing the Seven-Year Plan Ahead of Schedule

vetay GRES; V. Ye. Sirotyukov, head of the technical information bureau of the Novocherkasskiy elektrovozostroitel'nyy zavod (Novocherkassk Electric Locomotive Plant); I.I. Rafalovich, chairman of the NTOEP thermal engineering section; N.V. Sinel'nikov, chairman of the NTOEP section for rural electrification; N.T. Babayev, chairman of the NTOEP section for automation, remote controls and electrical communications; and others. The resolution approved by the plenary session dealt with the obligations for the current Seven-Year Plan. Besides pledges for saving more fuel, increasing the extent of rural electrification and assistance to industrial installations, the construction of the Novocherkassk GRES is mentioned. It is said that the decision was made to construct this power plant with open arrangement of turbines and boilers. The plans for such installations have been developed by the Rostov division of "Teploelektroproyekt" since 1956.

Card 2/2

KAPITSKIY, R.A., inzh.

Province scientific technological conference on mechanization and automation in the manufacture of machines. Mekh.i avton.proizv. 14 no.3:48 Mr '60. (MIRA 13:6)
(Machinery industry--Technological innovations)
(Automation)

KAPITSKIY, R.A.

Machine manufacturers in Rostov. Mashinostroitel' no.2: 47-48 F '60. (MIRA 13:5)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo pravleniya Nauchno-tekhnicheskogo obshchestva Mashproma.
(Rostov-on-Don Province--Technological innovations)

KAPITSKIY, R.A., inzh.

Third All-Union Scientific Technical Conference. Trakt. i sel'khozmash. 31 no.7:48-3 of cover Jl '61. (MIRA 14:6)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo pravleniya nauchno-tekhnicheskogo obshchestva machinostroitel'noy promyshlennosti.

(Agricultural machinery industry)

KAPITSKIY, R.A., inzh.

All-Union conference on the exchange of experience in the work of the laboratories of electric power plants. Elek. sta. 31 no.9:86-88 S '60. (MIRA 14:10)
(Electric laboratories)

KAPITSKIY, R.A.

Rostov workers are fulfilling their pledges. Mashinostroitel' no.10:16 O '61. (MIRA 14:9)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo pravleniya Nauchno-tekhnicheskogo obshchestva mashinostroitel'noy promyshlennosti.

(Rostov Province--Machinery industry)

KAPITSKIY, R.A., inzh.

Technical conference problems concerning the use and increase of operational reliability of new and presently operating boiler systems with high and superhigh parameters. Teploenergetika 8 no.1:93-94 Ja '61. (MIRA 14:4)
(Boilers—Congresses)

S/129/62/000/009/006/006
E193/E383

AUTHOR: Kapitskiy, R.A., Engineer

TITLE: Fourth All-Union Scientific Conference on Metallography and Modern Methods of Heat-treatment of metals

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov, no. 9, 1962, 61 - 62

TEXT: 53 papers were read during this conference, held at Rostov-on-Don from June 5 - 7, 1962. Of these only 3 are mentioned specifically by the present author: a paper by G.I. Pogodin-Alekseyev on special alloys prepared with the application of ultrasonics; a paper by Doctor of Technical Sciences V.A. Kislik and Candidate of Technical Sciences A.I. Karmazin on the contact strength of heavy section rails. and a paper by Candidate of Technical Sciences V.N. Tkachev and Engineers A.G. Radchenko and B.M. Fishteyn (Rostovskiy nauchno-issledovatel'skiy institut - Rostov Scientific-research Institute) on "Mechanism of fracture of the case-hardened layer of transmission gears". Reference was made in the resolution adopted by the conference to the benefits derived by Soviet

Card 1/3

Fourth All-Union ....

industry from the application of processes such as volume and surface hardening by RF heating, nitriding, boriding, etc. The importance of the pioneering work done in the Soviet Union on hot-stage metallography and on the development of thermo-mechanical treatment was stressed; the latter treatment made it possible to improve the high-temperature properties of austenitic steels. It was agreed that further development of thermomechanical treatment as a means of improving the strength of metallic materials of construction, and work on the application of ultrasonics in the manufacture of alloys by better metallurgy methods should be given higher priority in future research and development work. Appropriate government agencies were requested to institute work on the design and manufacture of industrial equipment for thermomechanical treatment, on the development of high-strength steels suitable for the manufacture of modern, cold-working equipment and on the serial production of equipment for hot-stage metallography. The use of boron and bismuth additions in the production of malleable cast iron was recommended

Fourth All-Union ....

on the grounds that it shortened the annealing time. Finally, it was decided to develop a standard method of measuring and calculating the hardness of metals and alloys.

ASSOCIATION: NTO Mashprom

Card 3/3

KAPITSKIY, R.A.

Scientific and technical conference on the electric power supply of the industrial enterprises of the Rostov Province. Prom.energ. 17 no.5:56 My '62. (MIRA 15:5)
(Rostov Province—Electric power distribution)

KAPITSKIY, R.A.

New equipment for farms. Mashinostroitel' no.7:20-21 Jl '62.
(MIRA 15:7)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo pravleniya Nauchno-tekhnicheskogo obshchestva mashinostroitel'noy promyshlennosti.
(Rostov Province—Agricultural machinery industry)

KAPITSKIY, R.

Scientific achievements and technological innovations should be introduced into industrial production. [illegible] no.9:23-24 S '62. (MIRA 16:1)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo soveta nauchno-tekhnicheskikh obshchestv.
(Rostov Province—Research, Industrial)
(Rostov Province—Technological innovations)

KAPITSKIY, R. A.

Voluntary principles. Mashinostroitel' no.12:42-43 D '62.
(MIRA 16:1)

(Rostov Province—Machinery industry)

KAPITSKIY, R.A.

Best achievements of mechanical engineers of Rostov Province.
Mashinostroitel' no.3:39-40 Mr '63. (MIRA 16:4)
(Rostov Province--Technological innovations)

KAPITSKIY, R.A., inzh.

Fourth All-Union Scientific and Technical Conference on Metallography and Progressive Methods of the Heat Treatment of Metals. Metalloved. i term. obr. met. no.9:61-62 S '62. (MIRA 16:5)

1. Zamestitel' predsedatelya Rostovskogo oblastnogo pravleniya Nauchno-tekhnicheskogo obshchestva Gosudarstvennogo tresta mashinostroitel'noy promyshlennosti.
(Physical metallurgy--Congresses)

KAPITSKIY, R.A., inzh.

Results of a competition on best work in production and research. Energetik 11 no.6:25-26 Je '63. (MIRA 16:7)

(Power engineering)

KAPITSKIY, R.A., inzh.

Let's speed up public work. Energetik 10 no.9:32-33 S '62.
(MIRA 17:1)

KAPITSKIY, R.A.

Conference on efficient use of electric power and operation of electrical systems in the industrial enterprises of the Rostov Province. Prom. energ. 19 no.1:52-53 Ja '64. (MIRA 17:2)

KAPITSKIY, R.A.

Competition on the best suggestions on measures for decreasing breakdowns and the increasing of the operational reliability of equipment. Energetik 13 no.1:37 Ja '65. (MIRA 18:3)

KAPITSKIY, R.A., inzh.

Power engineering workers of Rostov are fighting for the economy of power resources. Prom. energ. 21 no. 1:11-13 Ja '66 (MIRA 19:1)

KAPITSYNA, Ol'ga Leont'yevna; YEGOROVA, Nina Ivanovna; SUKHAREV, M.I., kand. tekhn. nauk, red.; FREGER, D., red.izd-va; GVIRTS, V.L., tekhn. red.

[Standardization of shirt parts; experience of the "Krasnaia Rabotnitsa" Clothing Factory in Leningrad] Unifikatsiia detalei verkhnikh sorochek; opyt raboty leningradskoi shveinoi fabriki "Krasnaia rabotnitsa." Leningrad, 1962. 16 p. (Leningradskii dom nauchno-tekhnicheskoi propagandy. Obmen peredovym opytom. Seriia: Shveinaia promyshlennost', no.4) (MIRA 16:3)

(Leningrad—Shirts, Men's)

KAPKAYEV, R.A.

Pathomorphology of the neruoreceptor apparatus in primary and secondary syphilis before and after ecomonovocillin therapy. Vest. derm. i ven. 34 no. 5:52-55 '60. (MIRA 14:1)
(SYPHILIS) (PENICILLIN) (SKIN—INNERVATION)

SHAPIRO, K.Ya.; GLEBOV, Yu.M.; TARAKANOV, B.M.; KULAKOVA, V.V.; KAPKAYEVA, Kh.

Production of ammonium paratungstate from autoclave solutions by an acid-free method. TSvet. met. 36 no.1:54-57 Ja '63. (MIRA 16:5)

(Ammonium tungstate) (Hydrometallurgy)

SPITSYN, Nikolay Aleksandrovich; KAPKANETS, Ivan Ivanovich; KOPTEVSKIY, D.Ya., red.; VORONINA, R.K., tekhn. red.

[Machine parts and hoisting and conveying machinery] Detali mashin i pod"emno-transportnye mashiny. Moskva, Gos. izd-vo "Vysshaia shkola," 1961. 331 p. (MIRA 15:2)
(Mechanical engineering) (Hoisting machinery)
(Conveying machinery)

AUTHOR: Kapkanets, I. I.

TITLE: Vacuum antifriction bearing. Class 47, No. 173075

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 14, 1965, 101

TOPIC TAGS: vacuum bearing, antifriction bearing

ABSTRACT: An Author Certificate has been issued for a vacuum antifriction bearing containing outer and inner races. To increase the cooling, an oval annular groove [illegible] the contacting surfaces between the races. The groove is filled with metallic sodium, [illegible] of heat.

ASSOCIATION: none

SUBMITTED: 25Oct63 ENCL: 00 SUB CODE: IE

NO REF SOV: 000 OTHER: 000 ATD PRESS: 4179

Card 1/1

VAYNSHTEYN, B.S.; KIYEVSKIY, V.G.; KAPKANETS, V.I., red.; DEMIDOV, Ya.F., tekhn.red.

[Manual for calculating the economic efficiency of introducing new technology in construction work for the petroleum industry] Metodicheskoe posobie dlia raschetov ekonomicheskoi effektivnosti vnedreniia novoi tekhniki v stroitel'stvo neftianoi promyshlennosti. Moskva, Otdel nauchno-tekhn. informatsii, 1957. 31 p. (MIRA 12:2)

1. Moscow. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvy ob"yektov neftyanoy i gazovoy promyshlennosti. 2. Rukovoditel' laboratorii ekonomiki Vsesoyuznogo nauchno-issledovatel'skogo instituta po stroitel'stvu ob"yektov neftyanoy i gazovoy promyshlennosti (for Vaynshteyn). 3. Starshiy inzhener Vsesoyuznogo nauchno-issledovatel'skogo instituta po stroitel'stvu ob"yektov neftyanoy i gazovoy promyshlennosti (for Kiyevskiy).
(Petroleum industry) (Building)

SAFARYAN, M.K., kand.tekhn.nauk; IVANTSOV, O.M., nauchnyy red.; KAPKANETS, V.I., red.; LEBEDEVA, D.V., tekhn.red.

[Steel tanks for petroleum products] Stal'nye rezervuary dlia khraneniia nefteproduktov; issledovaniia raboty konstruktsii. Moskva, Otdel nauchno-tekhn.informatsii, 1958. 239 p.
(Tanks) (MIRA 13:9)

RUCHIMSKIY, M.N., kand.tekhn.nauk; RATTI, G.V.; KAPKANETS, V.I., red.; POLYAKOV, M.G., tekhn.red.

[Instruction for determining loads acting on pipeline supports and establishing permissible spans between them] Ukazaniia po opredeleniiu nagruzok, deistvuiushchikh na opory truboprovodov, i dopuskaemykh proletov meshdu ikh oporami. Moskva, Otdel nauchno-tekhn.informatsii, 1959. 96 p. (MIRA 13:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov. 2. Vsesoyuznyy nauchno-issledovatel'skiy institut po stroitel'stvu magistral'nykh truboprovodov (for Ruchimskiy). 3. Glavnyy konstruktor otdela kommunikatsiy Giprogastoppproma (for Ratti).
(Pipelines)

KAPKANOV, S.

K-4

USSR/Forestry - Forest Cultures.

Abs Jour : Ref Zhur - Biol., No 20, 1958, 91556

Author : Kapkanov, S.
Inst :
Title : Field Shelter Forest Belts in the Steppe Zone of Ala-Tau Beyond the I'li River.

Orig Pub : S. kh. Kazakhstana, 1957, No 10, 38-40

Abstract : The Asiatic Smooth-leaved elm, the box-elder (Acer negrndo L.) and narrow-leaved oleaster are predominant in forest belts. The English oak and the European white birch which grow well under the most different steppe conditons are rare. According to the soil-climatic conditions the steppe zone of the oblast is divided into two sub-zones: the lower one with 180 - 200 mm of precipitation and the upper one with 350 - 560 mm per year. The field protective forest cultivation is planned especially for the upper sub-zone with intensive irrigation and non-irrigated

Card 1/2

KAPKAYEV, A., student IV kursa.

Hydrographical description of the Amu Darya Delta. Sbor.stud. rab. SAGU no.8:11-16 '54. (MLRA 9:5)
(Amu Darya Delta--Hydrology)

KAPKAYEV, A., student V kursa.

The formation of the Inzhener-Uzyak Delta. Sbor.stud.rab. SAGU no.12:33-41 '55. (MLRA 9:5)
(Inzhener-Uzyak Delta)

KAPKAYEV, E.A.

KAPKAYEV, E.A., promyshlenno-sanitarnyy vrach

Galovax as an industrial poison. Gig. i san. 22 no.11:79-81 N '57.
(MIRA 11:1)

1. Iz Respublikanskoy sanitarno-epidemiologicheskoy stantsii Bashkirskoy ASSR.

(VAXES, inj. eff.
galovax, as indust. pois. (Rus))
(OCCUPATIONAL DISEASES,
galovax pois.(Rus))

L 05277-67 EWT(d)/EWT(l)/EWP(v)/EWP(k)/EWP(h)/EWP(l) TG
ACC NR: AR6023994 SOURCE CODE: UR/0372/66/000/003/G025/G025

AUTHOR: Kapkayev, E. A.; Nayanzin, N. G.

50
B

TITLE: Elementary determination of the reliability of a self-correcting system

SOURCE: Ref zh. Kibernetika, Abs. 3G178

REF SOURCE: Sb. Vopr. vychisl. matem. i tekhn. Vyp. 7, Tashkent, Nauka, 1965, 85-89

TOPIC TAGS: system reliability, self adaptive control, probabilistic automaton

ABSTRACT: The probabilistic operation of a self-correcting system consisting of four elements is analyzed. These four elements are represented by two input and two output follow-up sensors. Each element operates correctly with the probability p_i and incorrectly with the probability $1-p_i$. The system has 3 stable states, of which only one corresponds to correct operation. Transition from one state to another is determined by the time-phase sequence. Formulas are presented for calculating the probability P that the system exists in the n-time phase in each of its stable states as well as the stationary probability (for $n \to \infty$). It is concluded that, when $n \to \infty$, the system arrives at one of the stable states with $P = 1$, i. e.

Card 1/2 UDC: 62-507.019.3

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ACC NR: AR6023994

"eternal" wandering is impossible. Formulas also are presented for the stationary P of the correct operation of the system with duplication of follow-up sensors. 3 illustrations.
I. N. [Translation of abstract]

SUB CODE: 12, 09/

Card 2/2 egh

KAPKAYEV, E.A. (Ufa)

Physiological shifts within the organism of workers engaged in the production of synthetic divinylmethylstyrene rubber. Gig. truda i prof. zab. 7 no.3:7-14 Mr'63 (MIRA 17:1)

1. Kafedra promyshlennoy gigiyeny TSentral'nogo instituta usovershenstvovaniya vrachey i Ufimskiy nauchno-issledovatel'skiy institut gigiyeny i professional'nykh zabolevaniy.

KAPKAYEV, R.A., Cand Med Sci --(diss) "Clinico-laboratory and patho-morphological changes in syphilitic patients ~~upon treatment~~ treated and preparations of according to 1954 schemes with acetonovocillin, arsenic ~~preparations~~ and heavy metals," ~~Prepublished~~ Tashkent, 1959. 17 pp (Min of Health UzSSR. Tashkent State Med Inst), 25 copies (KL, 30-59, 129)

-49-

KAPKAYEV, R.A., assistent

Complications in the treatment of syphilis with ecmonovocillin, arsenic-containing drugs, and salts of heavy metals. Med. zhur. Uzb. no.4:64-66 Ap '60. (MIRA 15:3)

1. Iz kafedry kozhnykh i venericheskikh bolezney (zav. - prof. A.A. Akovbyan) Tashkentskogo gosudarstvennogo meditsinskogo instituta.

(SYPHILIS) (ANTIBIOTICS)
(ARSENIC--THERAPEUTIC USE) (METALS--THERAPEUTIC USE)

VAKHIDOV, R.S.; KAPKAYEV, S.M.

Shaker for physicochemical studies. Zav. lab. 30 no.10:1285-1286 '64. (MIRA 18:4)

1. Kazakhskiy tekhnologicheskiy institut.

KAPKAYEVA, F.Kh., starshiy laborant

Bacteriological preparation of patients for surgery involving dissection of the eyeball. Oft.zhur. 15 no.2:81-85 '60.
(MIRA 13:5)

1. Iz kliniki glaznykh bolezney (zav. - prof. N.I. Arten'yev) Astrakhanskogo meditsinskogo instituta.

(EYE--SURGERY) (CONJUNCTIVA--BACTERIOLOGY)

MUKIMOV, S.M.; KAPKAYEVA, R.I.; BERGMAN, A.G.

The cyclic conditions of the chloride-sulfate lake Tuz-Kane. Trudy Inst. Khim. Akad. Nauk Uzbek S.S.R., Inst. Khim., Obshchaya i Neorg. Khim. No.2, 145-51 '49. (MLRA 5:12)
(CA 47 no.18:9072 '53)

KAPKAYEVA, R. I.

emical Abstracts
l. 48 No. 5
r. 10, 1954
neral and Physical Chemistry

Chem (4)

Solubility, viscosity, and specific gravity diagrams of the ternary system potassium iodide–potassium bromide–water at 0°, 15°, 35°, and 50°. S. M. Mukimov, R. I. Kapkaeva, and A. Bergman. *Trudy Inst. Khim. Akad. Nauk Uzbek. S.S.R.* 3, 55–60 (1952).—As a part of the investigation of the reversible reciprocal system KI + NaBr ⇌ KBr + NaI the soly., viscosity η, and sp. gr. of the ternary system KI–KBr–H_2O were detd. at 0, 15, 35, and 50°. The phase relations are given in triangular diagrams, and those of η and sp. gr. in rectangular. The ternary-phase equil. isotherms consist of 2 branches that meet at point *B* with 2 limited fields of solid solns. given for KI in wt. %: 0–95, 93.5–100; 0–13.5, 90.5–100; 0–19, 80.5–100; 0–26.1, 77–100, at 0, 15, 35, and 50°, resp. The isotherms for η and sp. gr. break sharply at *B*, forming max. The sp. gr., η, and the wt. % of KBr and KI at *B* are: 1.6506, 1.5107, 6.95, 83.57; 1.6980, 1.1984, 9.47, 83.03; 1.7442, 1.0000, 40.25, 34.70; 1.7628, 1.0030, 40.60, 57.14, at 0, 15, 35, and 50°, resp. The difference between the systems KCl–KBr–H_2O and KBr–KI–H_2O is considered remarkable in that the former gives continuous solid solns. from the freezing temp. −14.2 to 50° and higher (*C.A.* 37, 1323). This cannot be explained by the difference in ionic radii. Solubility, viscosity, and specific gravity isotherms of the ternary system potassium bromide–sodium bromide–water at 0° and 25°. S. M. Mukimov and R. I. Kapkaeva. *Ibid.* 67–74 (1952).—The isotherms of the ternary-phase equil. consist of two branches that meet at a point *B* the compn. of which, in wt. % for KBr and NaBr are: 4.80, 41.05 and 7.07, 44.36, at 0 and 25°, resp. The only solid phases indicated by the tie lines are KBr and NaBr.$2H_2O$. The sp. gr. and η form sharp max. at *B* at: 1.5609, 4.6423 and 1.5778, 2.0234 at 0 and 25°. The satd. solns. from the above study were dild. with water 4:1, 2:1, and 1:1; and the sp. gr. and η were detd. The curves of these undersatd. solns. were parallel to those of the satd. solns. [illegible] suggests a *method for the detn. of η and sp. gr. of [illegible] at satn.*

I. Bencowitz

7-19-54